

Office Action Summary

Application No.

10/538,284

Applicant(s)

KIM ET AL.

Examiner

PHILLIP A. JOHNSTON

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date _____
4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date 11-12-2008
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Detailed Action

1. This Office Action is submitted in response to the RCE/Amendment filed 9-3-2008, wherein claims 1, 4, 6, and 9-13 have been amended. Claims 1-13 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over, Keese, USPN 5,627,373, in view of Chang, USPN 6,288,401.

4. Regarding claims 1 and 6, Keese teaches the use of aperture 60 for electron beam alignment at Col. 6, line 32-67; and Col. 7, line 1-10, including;

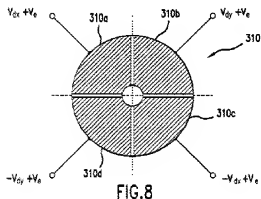
(a) Aperture 60 located at the center of faraday cup 62. Col. 5, line 55-62,

(b) Obtaining secondary electron images formed where the electron beam scans the conductive faraday cup at different directional orientations to an edge of aperture 60, which is equivalent to a plurality of sensing regions. See Col. 2, line 47-64; and Col. 7, line 3-18,

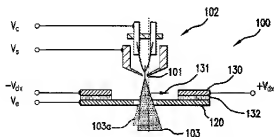
(c) Image signal intensity IND is measured at each beam scan location by pattern recognition circuit 48, where IND is the peak first derivative of the smoothed image intensity of each raster scan line averaged over all scan lines. Control circuit 50 stores signal IND, and calculates corrections to beam alignment. Col. 5, line 38-54.

Keese fails to disclose the use of an extractor with insulating portions including insulating material for prevention of the electron flow or low-doped semiconductor for reduction of the electron flow and dividing each of said sensing regions.

Chang teaches the use of centering extraction electrode 310 (note Figure 8 below) fabricated on a silicon substrate that includes four electrode elements 310a, 310b, 310c, and 310d (a plurality of sensing regions), which are separated by (divided by) insulating layers. Col. 5, line 6-18; and line 62-67.



Chang modifies Keese to provide an extractor where voltages ranging from a few tens of volts to a few hundred volts are applied to plural electrode centering regions to correct for misalignment of the electron beam from emitter 102. See Figure 4 below; and Col. 4, line 22-54.



Therefore it would have been obvious to one of ordinary skill in the art that Keese would use extraction and centering potentials superimposed on the split quadrupole extractor of Chang to provide a field emission source that produces a charged particle beam aligned with the optical axis. See Abstract.

5. Regarding claims 2, 3, 7, and 8, the combination of Keese and Chang teaches fabricating the extractor using conductive materials including metals and doped silicon (Col. 4, line 4-11; and Col. 6, line 7-14). One of ordinary skill in the art recognizes that doped silicon is the basic structure of p-n junctions.

6. Regarding claims 4, 5, and 11-13, the combination of Keese and Chang discloses the extractor used in these method claims, as described above regarding claims 1 and 6, which one of ordinary skill recognizes that aligning the beam in accordance with the combination of Keese and Chang, would include identifying (verifying) the sensing regions location, and determining when to repeat and/or terminate the alignment process. See Abstract of Keese.

7. Regarding claims 9 and 10, the combination of Keese and Chang discloses the extractor used in these method claims, as described above regarding claims 1 and 6, including first and second sides shown at 120 relative to the electron emitter 102 (the object) in Figure 4 above, where Chang discloses device components are also mechanically aligned in addition to electrostatic alignment. See Col. 2, line 1-8. One of ordinary skill recognizes that aligning the beam in accordance with the combination of Keese and Chang above, would include calculating relative positions of components

based upon measured data and adjusting their physical positions to achieve and maintain alignment of the field emission source with the optical axis.

Conclusion

8. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

November 12, 2008

/Phillip A Johnston/

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